Ra-223 or placebo respectively. Patients entered the model progression-free, receiving active treatment until progression or completion of the therapy course. Health states reflected patients experiencing first or subsequent SRE. In the trial, SRE was defined as treatment with external-beam radiation therapy (EBRT), surgical intervention, occurrence of pathological bone fracture, or spinal cord compression. A 5-year time horizon was considered. Costs were estimated from a US payer perspective. SRE costs were obtained by multiplying the number of patients experiencing SRE by its specific treatment cost (including hospitalization costs). **RESULTS:** Ra-223 increased mean life expectancy by 0.325 (95% CI: 0.324-0.326) years in the ITT population and 0.517 (95% CI: 0.516-0.518) years in the subgroup of patients who had not received first-line docetaxel. Ra-223 was projected to lead to 44% reduction in the cost of treatment of SREs versus BSC: 46% reduction in pathologic bone fracture costs; 48% for spinal cord compression; 16% for external beam radiation; and 11% for surgical interventions. A total of 32.9% of patients suffered a first SRE for Ra-223 versus 37.8% for placebo and 6.5% and 7.8%, respectively, suffered two or more SRE events. **CONCLUSIONS:** In patients treated with BSoC, Ra-223 reduced costs of SREs. Future studies will evaluate the total cost of care related to the benefit of Ra-223 versus placebo in patients treated with BSoC in mCRPC once the cost of therapy and the impact on quality adjusted survival are known.

PCN36

COST ANALYSIS MODEL BETWEEN THE COBAS BRAF TEST AND SANGER SEQUENCING WHEN TREATING MALIGNANT MELANOMA BASED ON THE PRESENCE OF V600 MUTATIONS

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OBJECTIVES: Validated companion diagnostic assays permit collection of critical clinical data that leads to actionable treatment decisions and better patient outcomes. The cobas BRAF test is an FDA-approved companion diagnostic that identifies V600 mutation positive malignant melanoma to determine patient eligibility for treatment with vemurafenib. Sanger sequencing is also a validated, lab developed test that provides similar information for the gene encoding the BRAF protein. Test performance differences can have an impact on patient outcomes and overall cost of testing and treatment. **METHODS:** Based on assay performance data for both tests, generated during the phase 2 BRIM-2 (N=132), BRIM-2/3 (N=433) and phase 3 BRIM-3 (N=449) studies, an integrated drug-diagnostic budget impact model was developed from a third-party payer perspective assuming a 6-month treatment period. Cost estimates were based on testing 100% unresectable stage III-IV melanomas assuming 50% incidence of BRAF mutations. Diagnostic costs were based on reimbursement for average code-stacks across various lab and therapeutic costs for vemurafenib (and ipilimumab) were inclusive of administrative and adverse event costs. Sensitivity models were run to estimate costs across a wide range of values for the various model parameters. **RESULTS:** Overall, the sum of invalid tests, false positive and false negative results across all 3 studies was 14.6% (148/1014) for Sanger sequencing and 0.6% (6/1014) for the cobas BRAF test. Use of the cobas BRAF test versus Sanger sequencing resulted in total saving of $14.2 million or $1,479.17 per patient in the BRIM-3 study and $21.9 million or $2,281.25 per patient in the BRIM2/3 dataset. Savings were primarily a result of avoiding unnecessary or inappropriate drug therapy and diagnostic costs accounted for a small fraction (0.13-0.29%) of total expenditures. **CONCLUSIONS:** Use of the clinically validated and more accurate cobas BRAF test resulted in significant cost savings relative to Sanger sequencing for BRAF mutations.

PCN37

IFOSFAMIDE TREATMENT OF PATIENTS WITH SOFT TISSUE SARCOMA: HEALTH CARE UTILIZATION AND COST IMPLICATIONS

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OBJECTIVES: Ifosfamide, a key chemotherapy for advanced stages of the rare cancer soft-tissue sarcoma (STS), is a generic medication. However, administration often entails hospitalization and adjuvant mesna as prophylaxis against hemorrhagic cystitis; resultant costs are unknown. This study examined health care costs and its drivers for managed care patients with STS who were treated with ifosfamide and other chemotherapies. **METHODS:** We retrospectively studied administrative claims of adult STS patients in a large US managed care plan who initiated chemotherapy between 2000–2011. The first chemotherapy treatment following diagnosis identified in medical claims was categorized by setting of chemotherapy initiation (ambulatory or hospital). Health care utilization and costs were identified over a 1-year follow-up (retaining patients dying prior to 1 year); patient/clinical characteristics were assessed over a 6-month baseline. Analyses included descriptive statistics and ordinary least squares on logged costs adjusted for patient/clinical characteristics (retransformed with smearing estimator). **RESULTS:** Ifosfamide-treated patients (alone, n=18, or combined with doxorubicin, n=47) were younger compared to the 149 patients in 4 other chemotherapy cohorts: means 50-52, versus 58 years for the next youngest (doxorubicin, gemcitabine+docetaxel cohorts), p=0.004. Total health care costs were significantly higher for ifosfamide cohorts (adjusted means $ 115,559 and $ 129,537) versus other cohorts except for gemcitabine+docetaxel (means ranged from $73,496 to $117,451, p<0.05). Differences in medical costs were due to higher ambulatory and inpatient expenditures for ifosfamide cohorts, which generally had higher numbers of visits including inpatient visits: ifosfamide means 0.94, 1.49, versus other cohorts 0.65, 0.72, 0.81, and 1.51 (gemcitabine+docetaxel), p<0.016. **CONCLUSIONS:** Patients with STS treated with ifosfamide had significantly higher health care costs than did patients treated with most other chemotherapies, suggesting that although a generic medication, ifosfamide may impose a higher disease management burden and impact on health plan budgets. Whether emerging therapies will result in lower health care costs warrants exploration.

PCN38

TREATMENT MODALITIES FOR HEPATOCELLULAR CARCINOMA: CUMULATIVE EXPENDITURES AND SURVIVAL IN SEER-MEDICARE

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OBJECTIVES: Incidence of hepatocellular carcinoma (HCC) is increasing in the U.S. and worldwide. Several treatments are available for patients newly diagnosed with the disease. We examine cumulative Medicare-paid expenditures and survival associated with various treatment modalities for HCC in a population for which it is most treated. **METHODS:** Medicare enrollees with an initial diagnosis of primary HCC between 2000-2007 were followed through 2009. Data are from SEER and linked Medicare databases, with claims generated from Parts A and B. Multivariate Cox proportional hazards models were used to estimate risk and calculate mean all-cause/HCC-related survival associated with transplant, resection, liver directed therapy, radiation, systemic chemotherapy or no treatment. Partitioned inverse probability-weighted least squares regression estimated cumulative Medicare expenditures adjusted for censoring and covariates. Bootstrapping was used to obtain 95% Confidence Intervals for cost estimates. **RESULTS:** Cancer stages one, two, three and four represented 24%, 9%, 14%, and 17% of the 11,047 patients, respectively. Nearly one-third (37%) were unstaged, 66% were male, 75% Caucasian, 10% African American; 60% of patients were untreated, 16% liver directed, 8% chemotherapy, 8% resection, 4% radiation, and 4% transplant. Using all-cause (HCC-related) mortality, transplant patients incurred an average $263,296 [95%CI: $244,200-$282,392] over an average 5.47 (6.9) years, resection $131,812 [$126,770-$136,854] over 3.5 (5.1) years, liver directed $91,488 [$88,749-$94,227] over 2.2 (3.8) years, chemotherapy $55,379 [$53,442-$57,316]over 1.2 (2.8) years, radiation $58,308 [$55,355-$61,261] over 1.2 (2.6) years, and no treatment $27,937 [$27,355-$28,519] over 0.6 (1.1) years. **CONCLUSIONS:** Cumulative Medicare expenditures were over 9x higher for transplant versus no treatment, nearly 5x for resection, over 3x for liver directed, and nearly double for chemotherapy or radiation, even after adjusting for cancer stage and other confounders. Differences in Medicare spending between treatment modalities were nearly proportional to differences in (all-cause) years survived after HCC diagnosis.

PCN39

REAL-WORLD DATA ANALYSIS OF COLORECTAL CANCER (CRC) TREATMENT WITH BIOLOGIC DRUGS IN A MEDICAL COOPERATIVE IN BRAZIL

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OBJECTIVES: Colorectal cancer is the third highest incidence amongst all cancers worldwide. Biologics are increasingly used as a treatment option, and due to high associated drug cost HMOs need to minimize expenditures by choosing less costly treatment strategies. Real-world data is growing in importance in health care decision making especially in coverage and reimbursement decisions. Therefore, the objective of the study is support treatment decision making by providing evidence based on real-world data, focusing on most used biologics in metastatic CRC: bevacizumab and cetuximab. **METHODS:** A review of administrative claims database of Unimed São José do Rio Preto (medical cooperative responsible for 118,000 lives in São Paulo-Brazil) was conducted for patients who underwent CRC treatment between December 2009 through January 2012. In order not to disclose confidential commercial arrangements with suppliers analysis were focused on total costs of treatment (drugs, devices/materials and room taxes). In the cases where a single patient underwent treatment with more than one biologic the analysis was performed considering the different regimens for the patient, obtaining daily costs/regimen/patient, and then converted on monthly basis. Focus was given to costs related to bevacizumab plus chemotherapy (Bev+CT) and cetuximab plus chemotherapy (Cet+CT) regimens. Also, regimens were classified into irinotecan or oxaliplatin-based. Costs were reported in Brazilian Reais (BRL1.00~USD0.48 December 2012). **RESULTS:** A total of 108 CRC patients were identified and regimens were 22.7% Bev+CT and 16.3% Cet+CT. Approximately 80% of both biological drugs were combined with irinotecan-based schemes. Average cost/patient/month were BRL 12,585 (SD: BRL3,588) for Bev+CT and BRL 17,178 (SD: BRL3,797) for Cet+CT. **CONCLUSIONS:** Results indicate potential resource savings favoring bevacizumab. If all patients treated with cetuximab were treated with bevacizumab instead, it could averagely result in savings of BRL 64,301 per month (less 26.7%). Study had limitation regarding identification of treatment line and sample size precluded identification of statistical difference between treatments.

PCN40

COST EFFECTIVENESS ANALYSIS OF ABIRATERONE ACETATE AS TREATMENT FOR METASTATIC CASTRATION RESISTANT PROSTATE CANCER AFTER FAILURE OF DOCETAXEL USING DATA FROM REAL LIFE TREATMENT PRAXIS IN SWEDEN

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OBJECTIVES: Abiraterone acetate (AA), a selective androgen biosynthesis inhibitor, blocks the action of CYP17, thereby inhibiting adrenal and intratumoral

androgen synthesis. In a preplanned interim analysis of the Phase 3 trial COU-AA-301, AA plus prednisone (P) showed a significant overall survival (OS) benefit of 3.9 months vs placebo plus P (de Bono, NEJM 2011). A preplanned and updated analysis showed that the improvement in median OS increased from 3.9 months to 4.6 months (HR = 0.74) (Fizazi, Lancet Oncol 2012). The purpose of this study was to evaluate the cost effectiveness of AA vs P using data from Swedish patients. **METHODS:** A survival-based decision analysis model was developed incorporating 3 health states: progression-free survival, post-progression survival, and OS (indirect comparison). The cost-effectiveness model was populated with data from one placebo-controlled randomized clinical trial in which AA was an add-on to P (de Bono, NEJM 2011), and treatment duration from the name-patient-programme (NPP) in Sweden for patients with metastatic castrate-resistant prostate cancer post-docetaxel. Resource utilization and costs reflected Swedish treatment conditions within a broad societal perspective. Drug costs per 3-week-model-cycle were $3180 (€2300) and $53 (€41) for AA and P, respectively. **RESULTS:** Total costs per patient were $85270 (€67300) and $52700 (€41600) for AA and P, respectively. Quality-adjusted life years (QALYs) were 1.24 and 0.77 for AA and P, respectively. **CONCLUSIONS:** The results show that AA treatment compared to P has a cost per QALY gained of $69800 (€55000). AA provides an OS benefit with a highly manageable and benign safety profile, compared to P, which has negligible effects on OS and QoL.

PCN41

THE DIRECT HEALTH CARE COST OF PROSTATE CANCER: EVIDENCE FROM US NATIONAL SURVEY DATA

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OBJECTIVES: Approximately 2.8 million American men have a history of prostate cancer, the most prevalent cancer among men in the US. This study quantified the effects of prostate cancer on direct health care costs to insurers and patients. **METHODS:** Using data 1996-2009 from the Medical Expenditure Panel Survey (MEPS), a large, nationally-representative database from the US, this study performed multivariate analyses of the relationship between prostate cancer and direct annual health care costs to insurers and patients, at individual and US aggregate levels. All men age 40 and older with International Classification of Disease Codes, 9th revision of 185 were identified. **RESULTS:** The MEPS database included 1,399 patients with prostate cancer. Mean age was 72 years, and 71% were Caucasian. Prostate cancer patients incurred $9,300 more in overall annual health care costs per patient when compared to non-prostate cancer patients ($18,423 vs. $9,093). The majority of direct health care costs were borne by the insurer ($8,900) rather than the patient ($430). Prostate cancer had a larger effect on incremental costs for younger patients ($16,253 40-64 years vs. $10,236 65-74 years; $7,767 75+ years). When aggregated to the US population, prostate cancer accounted for an incremental annual cost of $14.27 billion. The largest aggregate costs were incurred by patients aged 40-64 years ($5.33 billion), compared to those aged 65-74 ($4.86 billion) and patients aged 75+ ($4.08 billion). **CONCLUSIONS:** These findings indicate that the cost burden from prostate cancer is quite large. Younger patients incur more direct health care costs, possibly due to more aggressive treatment practices, which may be related to more aggressive tumor burden. With aging of the population, prevalence of prostate cancer is expected to increase to 3.2 million in the US in 2020. Further research to understand these cost implications is warranted.

PCN42

COST OF LOST PRODUCTIVITY DUE TO PROSTATE CANCER: EVIDENCE FROM US NATIONAL SURVEY DATA

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OBJECTIVES: In terms of indirect cost, prostate cancer appears to have an adverse impact on work performance, due to the use of sick days by patients in the period after diagnosis. This study quantified the effects of prostate cancer on indirect costs related to work absence and unemployment among individuals age 40 and older. **METHODS:** Using 1996-2009 data from the Medical Expenditure Panel Survey (MEPS), a large, nationally-representative database from the US, we performed multivariate analyses evaluating the relationship between prostate cancer and indirect costs, at the individual and US aggregate levels. All men with International Classification of Disease Codes, ninth revision of 185 were identified. Costs by 2 age categories (40-64 years, 65+ years) were explored. Indirect costs were defined as lost worker productivity resulting from being unemployed or days of missed work as a result of illness. **RESULTS:** The MEPS database included 1,399 patients with prostate cancer. Mean age was 72 years, and 71% were Caucasian. Prostate cancer patients had a greater probability of being unemployed (40% vs. 34%) and a greater probability of missing work due to illness (68% vs. 47%) than non-prostate cancer patients. Employed patients with prostate cancer missed 9.3 more work days than individuals without prostate cancer (19.5 vs. 10.2). This resulted in an incremental indirect cost of $2936 per patient. Indirect costs due to prostate cancer were higher for patients aged 40-64 than patients aged 65+ ($6848 versus $1581). When aggregated to the US population, prostate cancer accounted for $4.21 billion in indirect costs, with $2.68 billion for patients aged 40-64 and $1.53 billion for patients aged 65 and older. **CONCLUSIONS:** These findings indicate that the indirect cost burden from prostate cancer is quite large, especially for younger patients. Further research is needed to determine the impact of disease severity on productivity-related costs.

PCN43

TREATMENT PATTERNS AND COST OF CARE BY LINES OF TREATMENT FOR COLORECTAL CANCER IN THE OPTUM ONCOLOGY RESEARCH DATABASE

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OBJECTIVES: Treatment patterns and cost of care are believed to vary substantially as patients with colorectal cancer (CRC) progress from first line through third line therapy. The aim of this study was to examine patterns and cost of care in these patients. **METHODS:** A retrospective analysis was performed using claims from the Optum Oncology Research Database. Patients aged 18 years and older, diagnosed with CRC between July 1, 2004 and December 31, 2010, who were insured by a commercial health plan were included in the study. Chemotherapy combinations were assessed for patients receiving first, second and third line of therapy for CRC; and for patients with and without metastatic disease. Inpatient, outpatient, chemotherapy, biologic-related, and total costs were compared by the Kruskal-Wallis test. **RESULTS:** A total of 1039 patients who received chemotherapy or biologic therapy for CRC were included. FOLFOX and fluorouracil monotherapy were the most common first-line therapies, each accounting for approximately 27% of patients who received any chemotherapy. Oxaliplatin-based regimens were most common for patients receiving second-line therapy (45% of patients). Irinotecan-based regimens were most common among patients receiving third line therapy (35% of patients). The median total cost of care increased significantly for patients receiving first ($25,782), second ($36,951), and third ($86,944) line therapy ($p<0.0001$ by Kruskal-Wallis test). Median costs were significantly greater for patients receiving third versus first line therapy for outpatient care ($39,952 vs. $15,521), inpatient care ($3,668 vs. $1,721 vs.), chemotherapy ($14,059 vs. $3,662) and biologic therapy ($28,824 vs. $4,899). Median total were significantly greater for patients with metastases ($39,001) compared with those without ($8,989; $p<0.0001$). **CONCLUSIONS:** Treatment patterns vary significantly by line of therapy in patients with CRC. The total cost of care increased significantly as patients received additional lines of therapy and is significantly greater for patients with metastases compared to those without.

PCN44

DIRECT MEDICAL COSTS OF CARCINOMA OF KIDNEY IN CHINA

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OBJECTIVES: Carcinoma of kidney (or renal cell carcinoma) is one common tumor for adults. The purpose of this study was to evaluate the direct costs of patients with carcinoma of kidney in China, producing an average cost per patient per year and the overall economic burden of the whole carcinoma of kidney population. **METHODS:** A cost-of-illness analysis was then performed. The Chinese Basic Medical Insurance Databases in 2010 were used to collect data on health care resource utilization and costs. 224 patients diagnosed with carcinoma of kidney were randomly selected by stratified two-stage sampling. All information of patient demographic characters, clinical and costs were collected for the analysis. Direct medical costs included were diagnostic tests, physiotherapy, surgery, drug and administration costs. The descriptive statistics was used to describe patients' demographic characters and costs. Prevalence data on carcinoma of kidney for the Chinese population was collected from literatures. The overall economic burden of the whole carcinoma of kidney population was estimated based on the costs per patient per year and the prevalence data. All costs referred to 2010. **RESULTS:** Total 224 patients (mean age 60.9 years; 72.6% male) were evaluated. Total costs per patient over 1 year amounted to Chinese Yuan (CNY) 17,366 (median: CNY15750, IQR: CNY7773 – CNY26285), with drug costs accounting for 50.14% of the total. Based the prevalence of carcinoma of kidney from literatures, there was about 74,809 patients of carcinoma of kidney. Costs for the nation are estimated at CNY 0.389 billion per year. **CONCLUSIONS:** The economic burden of carcinoma of kidney in China is considerable. The primary burden on patients was due to drugs.

PCN45

THE LABOR PRODUCTIVITY EFFECTS OF PROSTATE CANCER PATIENTS ON SPOUSES AND OTHER FAMILY MEMBERS: EVIDENCE FROM US NATIONAL SURVEY DATA

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OBJECTIVES: This study quantified the "spillover" effects of prostate cancer on indirect costs related to work absence and unemployment among spouses and other family members residing with prostate cancer patients, a topic that has received little attention in the literature. **METHODS:** Using 1996-2009 data from the Medical Expenditure Panel Survey (MEPS), a large, nationally-representative database from the US, this study performed multivariate analyses evaluating the relationship between prostate cancer and the indirect costs to family members and spouses of prostate cancer patients. Indirect costs were defined as lost worker productivity resulting from being unemployed or missed work-days as a result of prostate cancer. Spillover effects were calculated for all individual family members (including spouses) and for spouses separately, and projected to the US population. **RESULTS:** The MEPS database included data for 1,399 patients with prostate cancer, 1,121 family members and 874 spouses. Family members of prostate cancer patients were found to have incurred $1,319 in annual indirect